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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

verizon wireless

Donald C. Brittingham
Director – Spectrum Policy
Federal Relations
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August 31, 2001

EX PARTE OR LATE FILED

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Room: TW-A325
Washington, DC 20554

Re: **Ex Parte Meeting**
Establishment of Rules and Policies for the Satellite Digital Audio Radio Service in the 2310-2360 MHz Band, IB Docket No. 95-91
XM Request for STA, File No. SAT-STA-20010712-00063
Sirius Request for STA, File No. SAT-STA-20010724-00064

Dear Ms. Salas:

On August 30, 2001, Doug Brandon of AT&T Wireless, Karen Gulick of Harris, Wiltshire & Grannis (representing AT&T), Randall Schwartz and Dale Branlund of BeamReach Networks, Karen Possner, Neale Hightower, Bob Saunders, and Charles Featherstun of BellSouth Corporation, Mike Hamra of Metricom, Erin Dozier of Akin Gump (representing Metricom), Paul Sinderbrand of Wilkinson, Barker & Knauer (representing the Wireless Communications Association International), Mary O'Connor and Stephen Daugherty of WorldCom, and the undersigned (collectively "WCS Parties") met with representatives of the FCC's Wireless Telecommunications Bureau, International Bureau, and Office of Engineering and Technology, as well as representatives of XM Radio Inc. ("XM") and Sirius Satellite Radio Inc. ("Sirius"), to discuss the STAs filed by XM and Sirius and unresolved issues in the pending Notice of Proposed Rulemaking associated with the potential use of DARS terrestrial repeaters. Attending for the FCC were: Tom Sugrue, Chief of the Wireless Telecommunications Bureau, as well as David Furth, Tom Stanley, Ron Netro, and Cathy Seidel of WTB; Don Abelson, Chief of the International Bureau, as well as Anna Gomez, Ron Repasi, Rockie Patterson, Rick Engelman, Rosalee Chiara, and Sasha Field of IB; Bruce Franca, Acting Chief of the Office of Engineering and Technology, as well as Bob Eckert, Bruno Pattan, and Saj Durrani of OET, and Keith Larson of the Mass Media Bureau.

In this meeting, we discussed the interference problems caused by the deployment of DARS terrestrial repeaters by XM and Sirius and options for resolving these concerns. As the WCS Parties have stated in their respective filings to the FCC, the deployment of DARS terrestrial repeaters (especially those operating at power levels exceeding 2kW) will cause significant harmful interference to WCS operations. Dale Branlund, Chief Technology Officer and Vice President of Engineering for BeamReach Networks, presented a brief summary of the blockage problems caused by both blanketing interference (referred to as "brute force overload") and intermodulation distortion (IMD). A copy of Mr. Branlund's presentation is attached and a copy of his complete analysis is included in the Reply Comments filed by Verizon Wireless on August 30, 2001.

The BeamReach analysis concludes that the blanketing interference and IMD caused by the XM and Sirius proposals will create large exclusion zones that would effectively preclude the provision of WCS. For example, the analysis for Atlanta concludes that nearly 30% of the market would be excluded due to blanketing interference and more than 50% of the market would be excluded due to IMD.

The group discussed the potential for incorporating additional filtering in the front-end of the WCS receiver to resolve these interference problems. XM presented a white paper that included information on available filters to address this issue, and suggested that the use of such filters would be economical to employ in WCS base stations. The WCS Parties did not see the white paper prior to the meeting, but agreed to review it and provide more formal comments at a later date. While some of the WCS Parties agreed that it might be economical to incorporate additional filtering into the WCS base stations, there was no consensus on this issue due to the various business models and network architectures being considered by the WCS licensees. There was consensus on the conclusion that it would not be economical to incorporate additional filtering into the CPE.

There was considerable discussion about the potential adoption of a 2kW power limit for DARS terrestrial repeaters – as this is the current power limit that applies to WCS operations in the band. The IB and WTB Staff asked the WCS and DARS licensees if such a limit would be acceptable. The WCS Parties stressed that the deployment of 2kW repeaters would still cause significant interference to WCS operations. However, the majority of the WCS licensees indicated that they could accept this limit, but that they could not accept a higher limit. BeamReach and Verizon Wireless noted that the acceptability of a 2kW power limit hinges on the density of terrestrial repeaters that are deployed. Consequently, the WCS Parties urged the FCC to require XM and Sirius to file with the FCC information regarding their deployments of repeaters at or below 2kW. In addition to being a legal requirement necessary for grant of the pending STAs, it would also allow all the parties to assess the impact of 2kW repeaters on WCS operations.

XM and Sirius could not agree to a 2kW limit. However, representatives from XM presented a possible compromise that would allow the DARS licensees to deploy repeaters at levels above 2kW under certain conditions. The WCS licensees would have to accept and resolve all interference within a hypothetical "2kW exclusion zone" while the DARS licensees would be required to pay the WCS licensees for costs related to the resolution of interference cases resulting from the deployment of repeaters above 2kW. All parties agreed to consider the concept as well as other options.

Please include a copy of this ex parte presentation in the record for the above captioned proceeding. In accordance with § 1.1206 of the Commission's rules, an original and one copy of this ex parte presentation is being filed with the Secretary's office. If you have any questions, you may call me on (202) 589-3785.

Respectfully submitted,

Donald C. Brittingham

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cc: Don Abelson
Tom Sugrue
Bruce Franca
Anna Gomez
Ron Repasi
Rockie Patterson
Rick Engleman
Rosalee Chiara
Sasha Field
David Furth
Tom Stanley
Ron Netro
Cathy Seidel
Bob Eckert
Bruno Pattan
Saj Durrani
Keith Larson

BeamReach Networks

IMD Blocking Analysis Due to Terrestrial Repeaters

Dale Branlund
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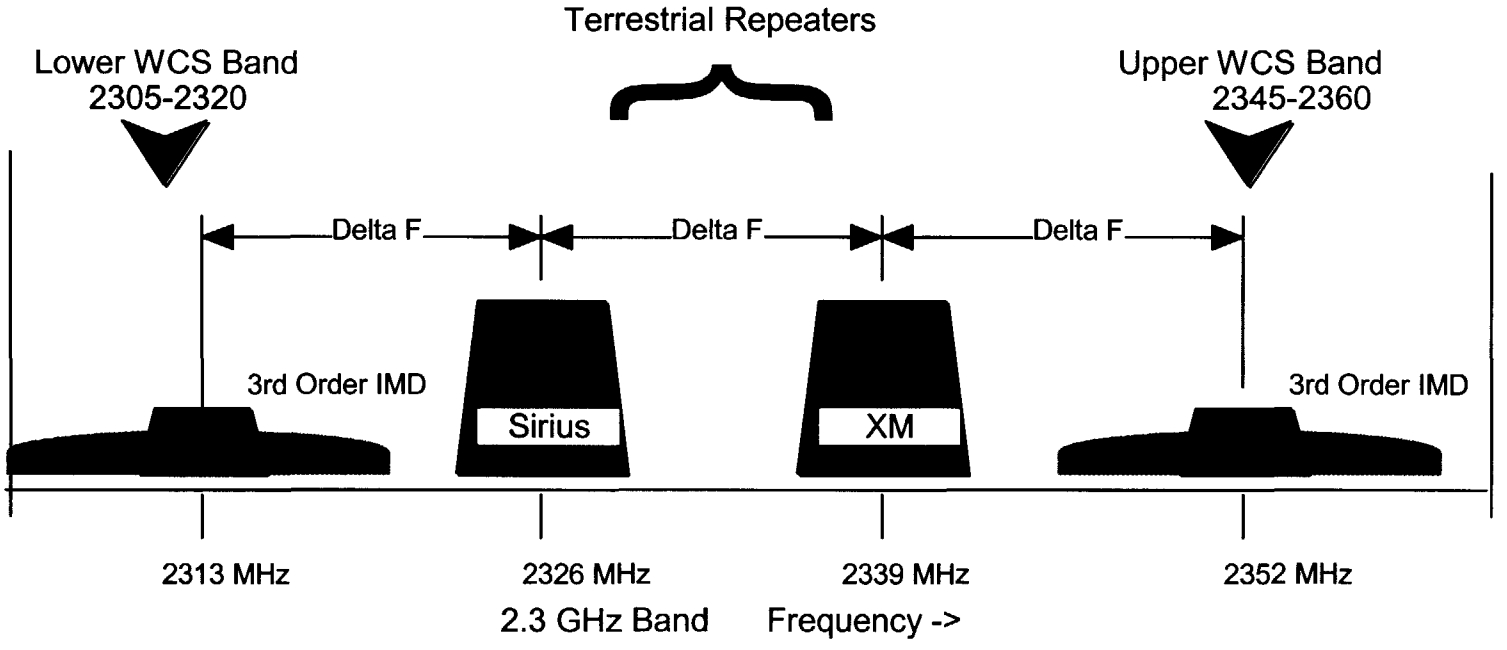
IMD Blocking OVERVIEW

- High Power Terrestrial Repeaters Generate IMD in WCS Receivers
- The Unfortunate Frequency Spacing Between Repeaters Causes IMD to Fall into the WCS Low and High Bands
- Repeater Power Density Too High
- Exclusion Zones around Repeaters for BWA Systems
  - In some cases, over 50% of the market is excluded
  - Exclusion zones typically larger that those cause by blocking
- Filtering Does Not Prove In Economically
  - Filtering Costs Too High for CPE
  - Adds additional power amplifier & power supply costs

The Intermodulation Distortion Problem Due to High Power DARS Repeaters



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Analysis of Greater Atlanta Region

- Terrain Based Modeling Tool - CommStudy
  - Longley Rice Propagation Model, 50% Confidence Factors
  - Full Terrain Modeling
  - Field Strength Analysis
  - Population Density Profiles
  - Computes % Population at given Field Strength
- XM and Sirius Repeater Data from Proposed Atlanta Deployment
  - EIRP
  - Antenna Patterns and Antenna Heights
- BeamReach Broadband Wireless Access Parameters
  - Directional Antenna
  - Sidelobe and Mainbeam Analysis
  - Actual Receiver Characteristics
  - Actual Measurements using XM/Sirius Type Modulation

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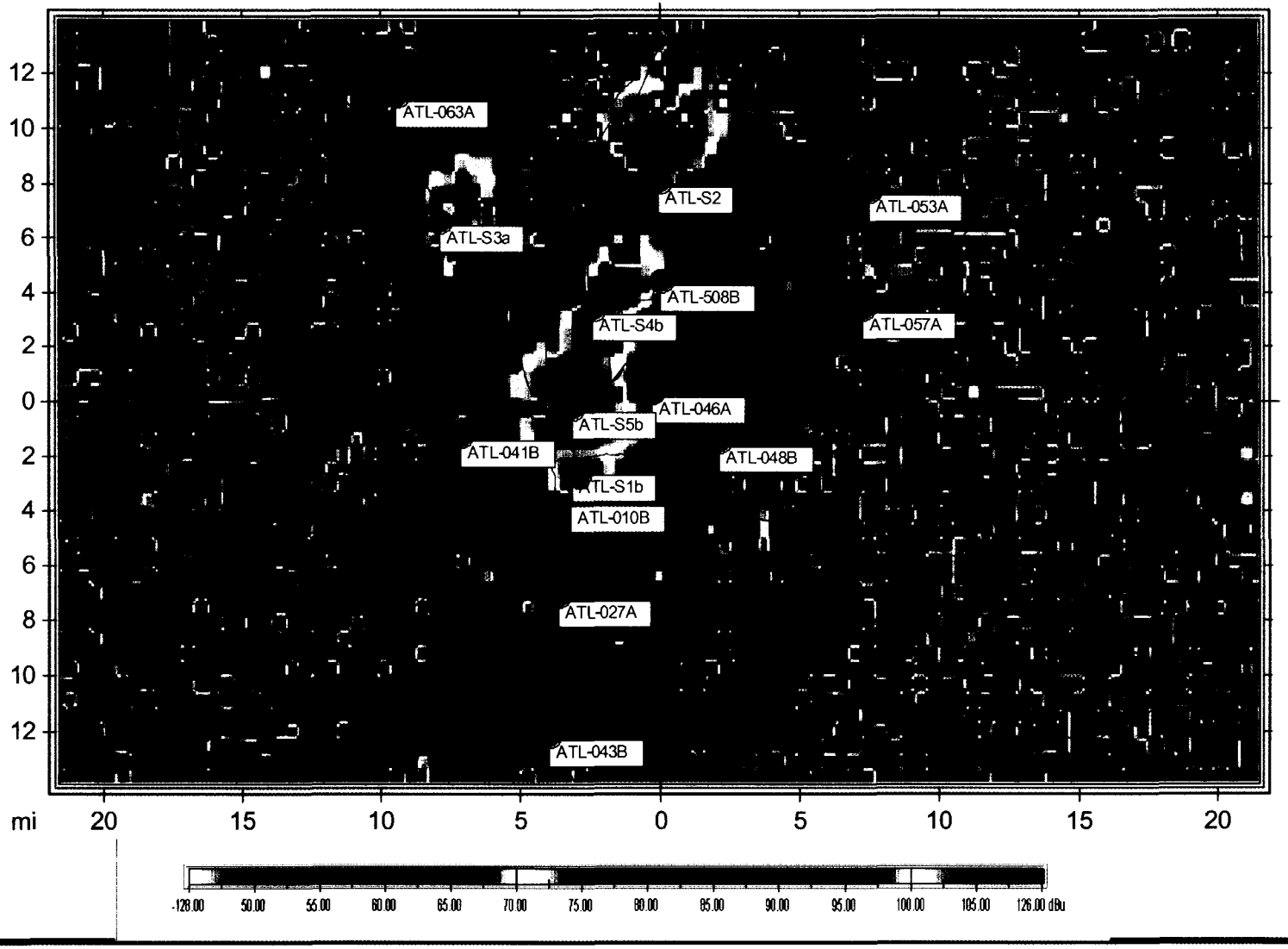
Sirius Repeater Field Strength, Atlanta, Longley Rice, 50%

Sirius



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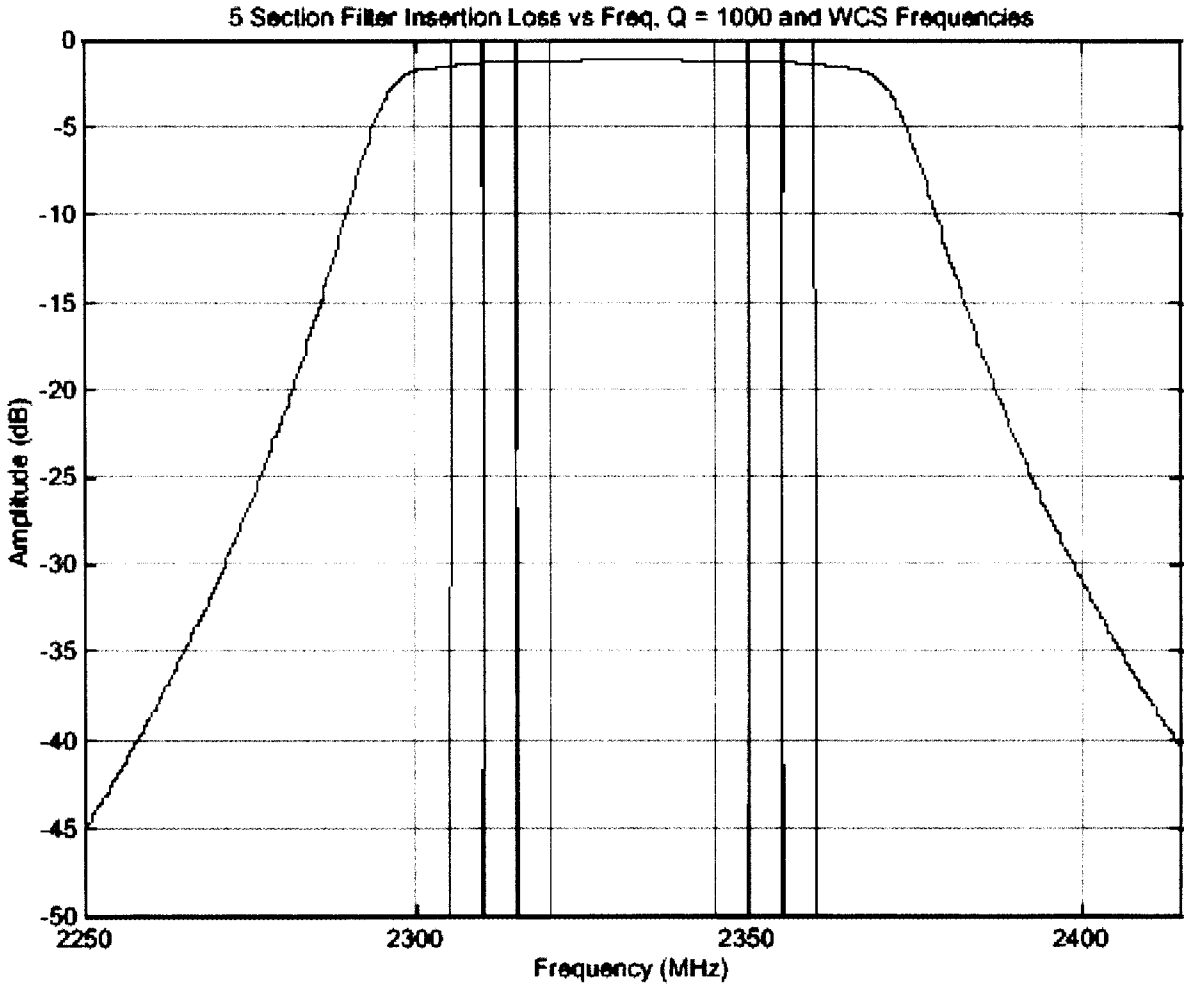
Exclusion Zone Results

Atlanta Case Study	Antenna Coupling Mechanism	Blocking Limited (pops)	IMD Limited (pops)
[redacted]	[redacted]	[redacted]	[redacted]
	Sidelobes Only	90,068	216,427
	Mainbeam/SL Only	710,953	902,521
[redacted]	[redacted]	[redacted]	[redacted]
	Sidelobes Only	133,208	248,747
	Mainbeam/SL Only	745,619	957,559
Total Population Effected	[redacted]	[redacted]	[redacted]
Total Population > 85 dBu		1,169,449	1,169,449
[redacted]		[redacted]	[redacted]

RF Bandpass Filter, BeamReach CPE



Parameter	Specification
1.5 dB Insertion Loss Passband	2305 to 2360 MHz
Rejection Characteristics	
DC to 2200 MHz	50 dB min
2200 to 2275 MHz	26 dB min
2390 to 2450 MHz	26 dB min
2450 to 4000 MHz	50 dB min

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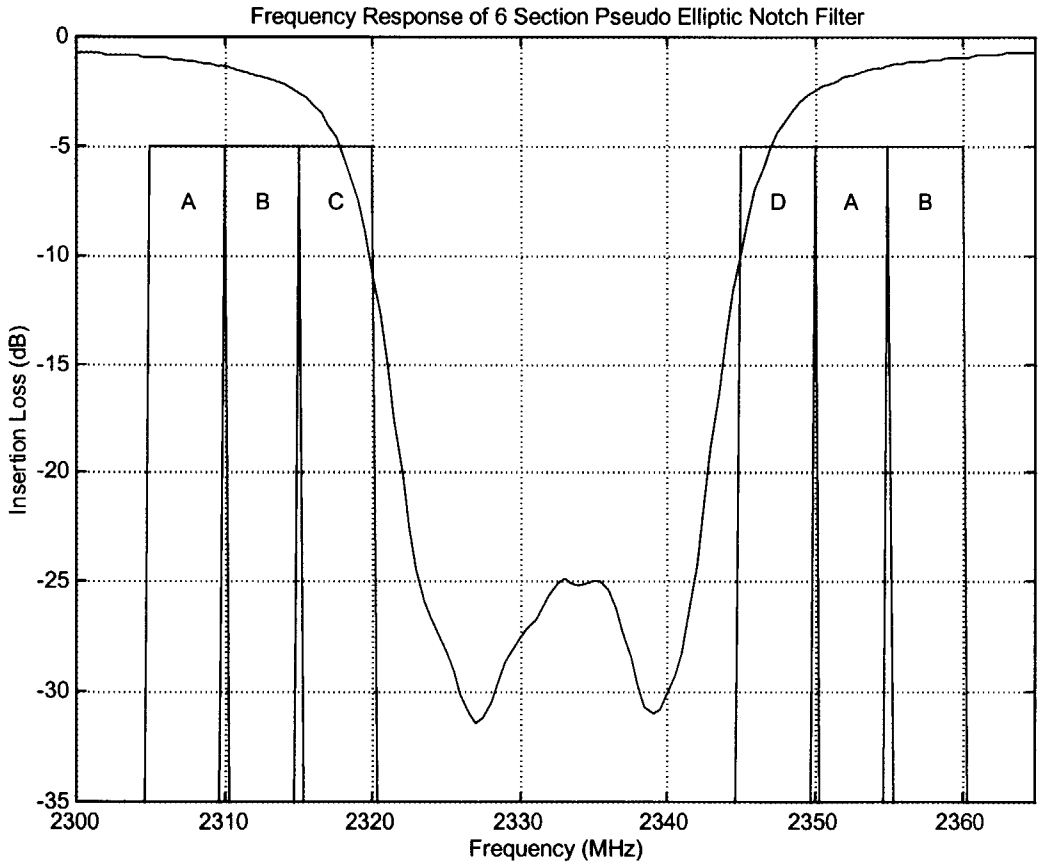
DARS Notch Filter, Bands A and B Only

- Bands A & B Only
- Additional 2.5 dB Loss
- Degrades Noise Figure
- Additional PA Power Needed
- Increased Power Supply and Heat Dissipation by approx.. 2x
- Filter + Amp Cost = $70
- Additional Cost for PS and Cooling



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Conclusion

- IMD Overload Due to Terrestrial Repeaters is Significant Problem
- Exclusion Zones Can Exceed 50% of Addressed Market
- Extensive Damage to BWA Business Case
- Terrestrial Repeater Power Density Too High
- Major Metropolitan Areas Effected
- Repeaters from one DARS Operator tends to spawn the introduction of Repeaters from the other DARS Operators

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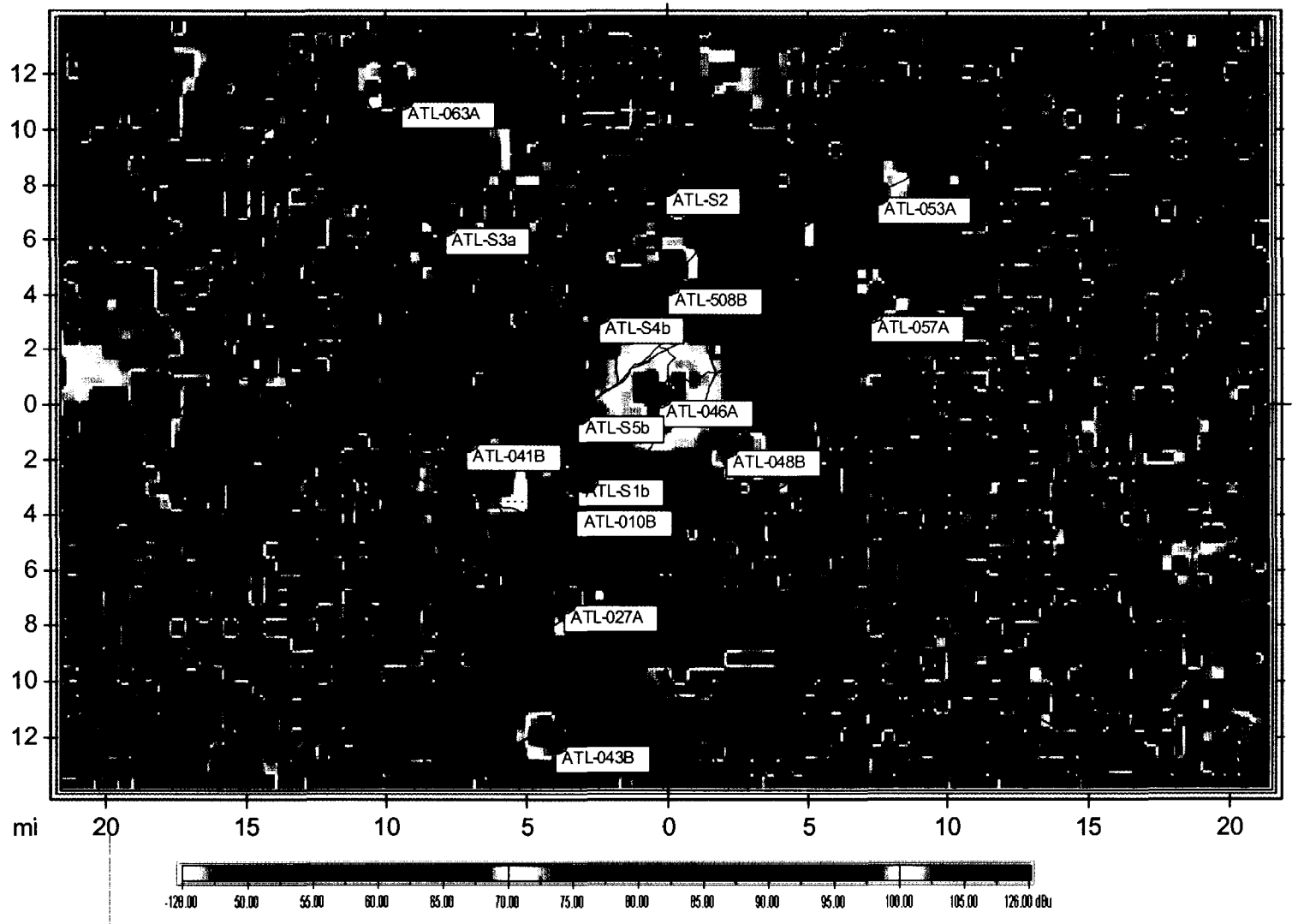
Recommendations

- Limit EIRP
  - No more than 400 watts/MHz with a maximum of 2,000 watts
- Field strength contours coordinated between XM and Sirius.
  - These contours should be –50 dBm/-80 dBm, -60 dBm/-60 dBm, and –40 dBm/-100 dBm
  - Reference Height of 25 ft for WCS Receiver
- Limit emissions
  - 80 dB + 10log(P) in concert with the rules that WCS operators must follow with respect to the DARS band
- Limit Strong Signal Blocking
  - A practical limit would be –45 dBm for no more that 2% of the population at reference height of the 25 feet in each coverage area.

XM Repeater Field Strength, Atlanta, Longley Rice, 50%

XM



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Population Density, Atlanta